



Pearson
Edexcel

Examiners' Report

Principal Examiner Feedback

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Pearson Edexcel Combined GCSE

In Biology (1SC0) Paper 2BH

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Question 1

Question 1a – Many candidates of a range of ability were able to recognise that the stomata would be in the water if they were on the lower surface. Candidates of higher ability understood the role of stomata in gas exchange and were able to state that this was a reason for the stomata being on the upper surface. A number of lower ability candidates for the paper linked stomata to uptake of water which is a common misconception seen at this level. There was also some confusion linking stomata to being the main site for photosynthesis and therefore needed to be on the top of the leaf in order to photosynthesise, although it is true that the guard cells of stomata have some chloroplasts this is not the role of the stomata.

Question 1biii – Many candidates of a range of abilities were able to correctly name the phloem and the process of translocation in the movement of sucrose around the plant and scored maximum marks. There were a few instances where candidates confused translocation with transpiration or linked the process with xylem.

Question 1c- Candidates found this concept a little more difficult mainly because they had to apply knowledge to a new situation, that they are unlikely to have encountered before. Most candidates recognised that the plant reproduced or grew quickly, some gave the idea of it being adapted to its conditions but only a few could link this idea to the fact that they outcompeted the indigenous species for limited resources.

Question 2

Question 2ai – A calculation of the mean number of starch grains was generally well answered with most candidates able to calculate a mean as is expected at GCSE level. Where there were errors this was mainly due to miscounting the starch grains or incorrect use of a calculator which will apply BIDMAS rules.

Question 2bi – This calculation proved to be challenging for candidates with many calculating the percentage of 30/50 as 60%. Many candidates did not show workings which may have prevented them gaining intermediate marks if they had the incorrect answer. The correct answer was credited full marks even without workings. Alternative methods of calculating the final mark of -40% were credited.

Question 2bii – Where candidates understood the practical task, they were able to give two correct variables such as the mass of the potato, the storage conditions or the temperature but several referred to making sure the starch grains were all the same size at the start which would not be possible for the practical. Other incorrect responses referred to the incubation time which is the independent variable.

Question 2biii – This question was well answered and possible answers included both respiration or release of energy. As always we do not credit incorrect science so to produce energy was not credited.

Question 2biv – The majority of candidates could recognise that the starch was broken down by an enzyme but few were able to link this to the breaking of bonds between the glucose molecules or

that this occurred at the active site of the enzyme. Named enzymes were accepted as long as they were carbohydrases.

Question 3

Question 3aii – This question revolved around the use of enzymes and why mashing a foodstuff before adding the enzyme would be an advantage. Candidates of higher ability recognised that this would increase the surface area of the food so the trypsin could break down more of it or to allow a faster rate of reaction. Common errors here were the reference to it being small enough for the baby to eat but this question relates to the manufacture of baby food.

Question 3bi and 3bii – These questions were linked and included a valid variable that need to be controlled during the experiment as well as how this could be controlled. The most common valid variable that was seen was temperature which could be controlled by using a water bath, but other methods of temperature control were also awarded the marks. Temperature cannot be controlled by using a thermometer, temperature is measured with the thermometer which is not the same thing and was not awarded the mark.

Question 3ci – This question was a data analysis question and the candidate as asked to describe the trends in the data, they did not need to give a response as to why this happened as this was a describe question. There were two major trends in the data, as the pH increased from pH1 to pH4 the time taken to digest the food decreased, after pH 4 the time taken to digest the food increased. A tip for candidates to use here is always to quote from the headings of the table when answering the question, quoting the independent variable first which is always on the left-hand side of the table.

Question 3cii – This was a rate calculation requiring the candidate to calculate how fast or slow the reaction took place at pH1. Many candidates managed the calculation but missed out the instruction of giving the answer to 1 significant figure or made errors on rounding.

Question 3ciii – This question asked candidates to explain the difference in the rate of reaction by using the data they were given and therefore we needed some understanding of the biological processes going on in the experiment. Candidates could answer this in one of two ways, by stating that at pH1 the rate of reaction was at it's lowest because enzymes were becoming denatured and this was the most common correct response. Alternatively, they could have identified that pH4 was the optimum pH as there is where the most enzyme/substrate complexes were formed. Many candidates only gave the difference in the rate of reaction for pH 1 or pH 4 but link it to the scientific detail so could only be awarded one mark.

Question 4

Question 4ai – Many candidates demonstrated the ability to accurately draw a graph using a linear scale and plot the points correctly. The marks least likely to be awarded were the drawing of the graph where candidates lost mark the mark as they either didn't draw a line, drew multiple lines or extrapolated it.

Question 4aii – This question asked for precautions to be used when handling blood samples, most candidates attained the marks available for using gloves or washing hand. Use of goggles or lab

coats were not awarded marks as these are standard laboratory procedures and not specific to blood samples.

Question 4bii – Many candidates obtained the mark for this question by identifying that the formation of a blood clot prevents bleeding or prevents pathogens from entering the body. It allows the blood to clot just repeats the stem of the question and was not credited.

Question 4c – Candidates were asked for one structure in a vein that helps the blood to return to the heart. The majority of candidates stated that valves prevented the backflow of blood, but some were also able to refer the fact that veins have a large lumen to maximise blood flow.

Question 5

Question 5a – Those candidates who attained the best marks on this question are those who describe the different stages that occurred in the graph. This was a comparison question so candidates needed to give a comparative for each stage in the graph. At rest person A had a higher heart rate than person B, person A's heart rate increased faster than person B's at the start of the exercise, during exercise person A's heart rate kept rising but person B's remained level. Person A's heart rate returned to their resting heart rate slower than person B. In addition to this a mark was awarded for a calculation of comparative data such as at rest person A's heart rate was 20 b.p.m. higher than person B's.

Question 5b – This question required the use of the cardiac output formula. Unfortunately, many candidates could not correctly recall the formula although it is on the specification. Those that could recall the formula applied it correctly but did not always remember to complete the conversion into litres per minute from millilitres.

Question 5c – This question was targeted at the higher ability candidates and many candidates found it challenging. Those candidates who did manage to score marks recognised that person A must have had a lower stroke volume than person B so needed a higher heartbeat to gain the same cardiac output. Some candidates gained a mark for stating they needed to have a higher heart rate in order to get enough oxygen or glucose to the muscles.

Question 6

Question 6ai – This was an interpretive question. Candidates needed to look at the images and interpret that the thyroid gland had enlarged, and this is where the majority of marks were awarded. Marks were also awarded for the idea that thyroxine production was increased. An increased metabolic rate is not an effect on the thyroid gland and was not credited.

Question 6b – This question was targeted at higher ability candidates. Candidates who had a good understanding of this topic were able to link together the stages of the negative feedback mechanisms and scored high marks for the question. Candidates with a less thorough understanding of this topic were able to gain a mark for the idea that the thyroid gland produces thyroxine.

Question 6c – This question was wide ranging and candidates scored across the mark range. The level of scientific detail determined the level awarded. For level 1 candidates needed to link at least one hormone to either the endocrine gland it was released from or its role in the menstrual cycle. In

order to go to the top of level 1 and thus attain 2 marks there must be a correct connection and a coherent flow to the answer. For level 2 at least 2 hormones linked to their role or the endocrine gland they are released from were needed, in order to go to the top of the level and attain 4 marks this had to be in a logical order, although the candidate could start at any point in the menstrual cycle. For level three at least three hormones linked to their role and the endocrine gland they were released from were required. To attain all 6 marks this needed to be ordered logically and coherently.

